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ABSTRACT

Along with the current epidemic of Acquired Immune Deficiency Syndrome (AIDS) has come what some have called an epidemic of fear. Two studies were conducted to explore lay responses to AIDS from the perspective of recent research on how lay people process illness information. The research examines the cognitive organization of disease information and the understanding which people have for specific categories of disease. The results of these two studies indicated that the primary dimensions used to categorize diseases were the extent to which the diseases were perceived to be contagious and serious/life-threatening. Further, the extent to which subjects were willing to interact with persons with specified diseases was a direct function of the extent to which the disease was contagious. The second study examined people's understanding of the concept of contagious disease. The results indicated that subjects tended to have a relatively simple and straightforward understanding of contagion. Subjects perceived flu, cold, and chicken pox to be the most typical of their concept of contagious disease. These findings have implications for understanding AIDS hysteria. (Author/NB)

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Illness Cognition and Responses to AIDS

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Abstract

Along with the current epidemic of Acquired Immunodeficiency Syndrome (AIDS) has come what some have called an epidemic of fear. This paper explores lay responses to AIDS from the perspective of recent research on how lay people process illness information. The research described in this paper explores the cognitive organization of disease information and the understanding which people have for specific categories of disease. Two studies are reported. The results of these studies indicate that the primary dimensions used to categorize diseases were the extent to which the diseases were perceived to be contagious and serious/life-threatening. Further, the extent to which subjects were willing to interact with persons with specified diseases was a direct function of the extent to which the disease was contagious. The second study then examined people's understanding of the concept of contagious disease. The results indicated that subjects tended to have a relatively simple and straightforward understanding of contagion. Further subjects perceived flu, cold, and chicken pox to be the most typical of their concept of contagious disease. The implications of these approaches for understanding AIDS hysteria are discussed along with the theoretical implications for illness cognition.

Illness Cognition and Responses to AIDS

George D. Bishop
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There is probably no disease in our life times that has generated more public discussion and been more an object of concern than the syndrome known as AIDS. All of us have heard the statistics on the number of people who have been diagnosed with AIDS or who have died from it along with the predictions of geometrically increasing diagnosis and death rates for the future. From a medical and psychological point of view there is certainly reason for great concern about this disease and its effects.

Along with the epidemic of the disease AIDS has come a second epidemic, what is best described as an epidemic of fear, dubbed by some as being afrAIDS. We are by now all too familiar with reports of highly fearful reactions when a child with the AIDS virus attends school or when a coworker or acquaintance develops AIDS, reactions which have included ostracism, dismissal from employment, boycotting of schools, and, in one case, the burning of a family out of their home. Given what we know about AIDS these responses to persons with the AIDS virus are highly irrational. To date not one person is known to have contracted the AIDS virus through the kind of casual contact involved in school or work settings. As the Surgeon General has pointed out AIDS is difficult to get, with transmission of the virus limited to such high risk behaviors as the sharing of infected needles and sexual relations with an infected person.

My purpose in this talk is to raise two general questions which have both theoretical and practical importance. The first is "What can AIDS hysteria tell us about illness cognition?" The individuals involved in the incidents cited appear to have some very strong notions about how diseases are transmitted. Study of these reactions may give us important clues about how lay people process illness information. Secondly, what can illness cognition tell us about AIDS hysteria? Given the fear which has been expressed toward persons with AIDS it is essential that we better understand this phenomenon so as to be able to appropriately deal with it. In addition we need to be prepared should we ever be faced with a similar situation with another new and unfamiliar disease.

To date most approaches to AIDS hysteria have been in fairly general terms. Probably the most common approach to AIDS hysteria has been to discuss it in terms of ignorance about how AIDS is spread. Individuals showing fearful responses to persons with AIDS are described as being ignorant and having inaccurate beliefs about AIDS. There are certainly data to support this notion. Surveys have shown that, while the majority of those surveyed gave correct

answers about the nature of AIDS and how it is contracted, a significant number of people still believe that AIDS can be transmitted through casual contact. For example, in the September 1987 National Health Interview Survey 18% of those interviewed believed that it was somewhat or very likely that a person could get AIDS by working near someone with AIDS and 36% believed that it was somewhat or very likely that a person could get the AIDS virus from eating in a restaurant where the cook has AIDS (Dawson, Cynamon, & Fitti, 1988). Fear of AIDS has also been discussed in terms of fear of the unknown (Triplet & Sugarman, 1987) as well as negative feelings about homosexuality (O'Donnell, O'Donnell, & Pleck, 1987).

While there is certainly merit to these approaches to AIDS hysteria, I would like to argue that in order to have a satisfying understanding of this phenomenon we need to go deeper. Although there has been, and still is, quite a bit of ignorance among lay people as to the nature of AIDS and how it is spread, people are acting on the beliefs that they hold about the disease, regardless of how appropriate or inappropriate they may be. This raises important issues about where these beliefs come from and how they are shaped, issues which go to the heart of illness cognition.

In addressing these issues my students and I have built on the work of a number of investigators, several of whom are on this panel, who have been concerned with the cognitive representations which lay people have of different diseases and illnesses. There is now strong evidence that people have relatively well formed and stable cognitive representations of different diseases and illnesses which have important implications for how they respond to symptoms and diseases. Howard Leventhal and his colleagues (Leventhal, Meyer, & Nerenz, 1980; Leventhal, Nerenz, & Straus, 1982) have noted that both hypertension and cancer patients have definite cognitive representations of their illnesses; representations which include the identity (label and symptoms) of the disease, its cause, likely course through time as well as its consequences. These disease representations often differ from orthodox medical views and have important implications for whether the person remains in treatment as well as how well unpleasant side effects are tolerated.

Rick Lau and his colleagues (Lau & Hartman, 1983; Lau, Bernard & Hartman, in press) have taken a different tack, investigating lay representations of common illnesses. Their work has replicated the four components of disease representations noted by Leventhal and have added the fifth component of cure. In addition, they have investigated how these cognitions are formed, their stability, as well as some of their implications.

My own work (Bishop, et al, 1987; Bishop & Converse, 1986) has put forth a prototype model of disease representations, arguing

that people's conceptions of different diseases can be thought of in terms of prototypes (or idealized conceptions) which people have for different diseases. These prototypes have implications for the recognition of disease states from symptoms (Bishop & Converse, 1986) as well as the speed and ease with which people process symptom and disease information (Bishop, et al, 1987).

In extending this work to AIDS hysteria our approach has been to examine the cognitive representations which people have of AIDS in the context of the overall cognitive framework which they use for conceptualizing physical diseases. As a first step we began by obtaining ratings from subjects on a series of bipolar scales for 22 different diseases including AIDS. Table 1 is a sample from

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Insert Table 1 about here.
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the questionnaire which shows the scales used. The rating scales selected were ones which have been shown to be useful in previous studies of illness perception (cf. Bishop, 1987) and include a variety of potentially relevant disease characteristics. Ninety-nine subjects fill out this questionnaire which provided the basic data for assessing disease representations. Means were computed across subjects for each disease on each scale and then multidimensional scaling (cf. Schiffman, Reynolds, & Young, 1981) and cluster analysis (Anderberg, 1972) were used to examine the dimensions underlying the disease ratings as well as the cognitive groupings of the diseases.

Before we get to the MDS results it is of interest to note how our subjects rated AIDS on each of these scales. Table 2 gives

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Insert Table 2 about here.
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these ratings. As can be seen in this table, AIDS was rated as being a very fearful, life threatening, and highly contagious disease which is quite common and fairly easy to get. Interestingly, while subjects saw AIDS as relatively easy to get, they rated themselves as being quite unlikely to get it. The second column of means in this table shows the average rating which subjects gave on each of these scales across diseases.

To further examine subjects' concepts of AIDS relative to other diseases, the means for each disease on each of the questions were used to compute distances between diseases which were then subjected to MDS and cluster analysis. Examination of the solutions obtained indicated that a two dimensional solution was

adequate (stress = .116, R^2 = 0.93). A plot of the two dimensions obtained is shown in Figure 1. We then utilized canonical

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Insert Figure 1 about here.

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regression and cluster analysis to interpret this solution. The canonical regression suggested that the two MDS dimensions represent the extent to which diseases are perceived to be 1) contagious and 2) serious/life threatening. This is corroborated by an inspection of Figure 1 in which contagious diseases (e.g., AIDS, flu, hepatitis, polio, mononucleosis) are located in the upper right-hand portion of the plot while diseases which are not contagious (e.g., stomach cancer, heart attack, arthritis) are located in the left-hand portion. Further, life threatening illnesses tend to be located in the lower left-hand section of the plot while non-life-threatening diseases (e.g., chicken pox, mononucleosis, sinus infection) are located in the right-hand portion.

We also clustered the diseases using the K-means procedure. Examination of these results suggested four interpretable clusters which are also shown in Figure 1. These four clusters essentially represent the four combinations of contagious vs. non-contagious and life-threatening vs. non-life-threatening.

These results, then, argue that the two basic dimensions being used in conceptualizing diseases are contagiousness and the extent to which the disease is serious and/or life-threatening. AIDS was perceived to be both very contagious and extremely life-threatening.

We also wanted to examine the ways in which these disease representations were related to people's willingness to interact with persons who have been diagnosed with different diseases. In this same study we asked subjects to fill out a second questionnaire, the Patient Interaction Questionnaire, which contained a series of twelve brief stories about a person who had been diagnosed with one of the diseases in the first questionnaire. Examples of the stories used are shown in Table 3. The twelve diseases used in this questionnaire were selected so as to

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Insert Table 3 about here.

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include both contagious and non-contagious diseases as well as diseases which are serious and/or life-threatening as well as those which are relative non-serious. Each vignette was presented on a separate page followed by questions concerning how serious the

disease was, how responsible the person was for their disease and how willing the person would be to meet the person, work with them, have them as a guest in their home, go to school with them, live next door to them, and spend several hours with them. Responses to these items were on 7-point scales scored such that higher scores indicated greater willingness to interact with the person in the story. In addition, a total interaction score was computed which consisted of the sum of the six interaction scales.

The means for each of the six interaction scales as well as the total interaction score are given in Table 4. As can be seen

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Insert Table 4 about here.

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in this table, there appear to be basically two clusters of diseases. Contagious diseases (including AIDS, flu, genital herpes, hepatitis, mononucleosis) all have relatively low total interaction scores (30 or below), indicating unwillingness to interact. Non-contagious diseases (including appendicitis, arthritis, heart attack, lung cancer, migraine headache, and sinus infection) all have relatively high total interaction scores (37 or above). Polio, with a total score of 35.36, is positioned between the two clusters. Correlation of the mean interaction scores for each disease with perceived contagion (Table 5)

Insert Table 5 about here.

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indicated that the extent of perceived contagion directly predicts subjects' willingness to interact with someone having the disease in question. Interestingly, ratings of the extent to which a disease is life threatening showed no correlation with willingness to interact with a person having that disease (all r's <.29, p ns).

Finally, we examined the extent to which subjects' specific cognitions about AIDS influenced their willingness to interact with someone who had AIDS. To do this we divided the range of total interaction scores for AIDS into equal thirds. As scores on this measure ranged from 6 (not willing to interact with the AIDS patient on any of the six scales) to 42 (complete willingness to interact regardless of setting), we defined subjects with scores from 6 to 18 as being "phobics", while those with scores from 31 to 42 were defined as being "nonphobics". Subjects with scores of 19 to 30 were not used in these analyses. As the distribution of scores on this variable was fairly even across the range of scores, this resulted in 40 subjects in the nonphobic and 31 subjects in the phobic groups. The remaining 28 subjects had scores between the two groups. Overall, the differences between the two groups

were not very large. The overall multivariate F-ratio only approached significance ($F(17,50) = 1.62$, $p < .10$)[1] and significant or near-significant differences were found for only three scales. The scales on which differences were found, however, are highly suggestive. As noted in Table 6, a substantial difference was

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Insert Table 6 about here.
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obtained between the groups in their ratings of the extent to which AIDS is caused by the environment with phobics giving significantly higher ratings than nonphobics. In a similar vein, phobics rated AIDS as being less preventable than did nonphobics. Finally, phobics rated AIDS as being slightly more painful.

The results of this study are very clear in showing that the primary dimensions used in cognitively organizing physical diseases are contagion and the extent to which the disease is serious or life-threatening. Further, willingness to interact with someone diagnosed with a particular disease is a direct function of the perceived contagiousness of that disease. The extent to which a disease is perceived to be serious or life-threatening has no impact on willingness to interact.

Given the centrality of perceptions of contagiousness in people's perceptions of diseases and their willingness to interact with disease victims, we conducted a second study to obtain a more complete picture of subjects' understanding of the concept of a contagious disease. Although both flu and AIDS are contagious diseases they are transmitted in very different ways. Yet, from the results of our first study it appears that subjects may not have been differentiating these different types of contagion. Our goal in this second study was to investigate the possibility that people have a relatively undifferentiated concept of contagious disease. In other words, when thinking about contagious diseases people may not, at least immediately, make distinctions between ways in which different contagious diseases are spread but, rather, have a kind of generic concept of a contagious disease which is then applied whenever a disease is labeled contagious. Further, it seems intuitively plausible in light of work on prototypes, both for physical objects (cf. Rosch, 1978) and specific diseases (Bishop & Converse, 1986) that certain diseases may be perceived to be prototypical of the class of contagious diseases. If this is the case then these diseases would provide the "default" values for how the disease is spread when a new or unfamiliar disease is labeled as being contagious or caused by a virus, concepts which from subjects' ratings appeared to be fairly synonymous in our sample ($r = .92$). To investigate these possibilities a second group of subjects was asked to give their own definitions of what it means to say that a disease is contagious, to list and rate

possible modes of transmission and, finally, to list and rate diseases in terms of how typical they are of their concept of a contagious disease.

The results of this study were quite clear in supporting our suspicions. Examples of some of the definitions obtained are shown Table 7. For the most part these definitions were relatively

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Insert Table 7 about here.

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simple and straightforward. To examine these definitions further they were content analyzed to obtain the discrete elements included. The categories obtained and their frequencies are shown in Table 8. As can be seen here 98% of the definitions included

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Insert Table 8 about here.

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a statement to the effect that contagious diseases are diseases which are passed from person to person. Interestingly, nine subjects (our of 53) included as part of this statement the qualification that the disease was transmitted easily. Just over half of the subjects also included one or more ways in which contagious diseases are spread. For those listing modes of transmission the largest number included one or more types of casual contact, such as through the air, touching, and drinking from the same water glass. Less than half that many mentioned one or more forms of "blood contact" (e.g., sexual intercourse, blood transfusions, and contaminated needles) which are associated with the transmission of AIDS. In addition, ten subjects stated that contagious diseases were passed through contact but did not specify what type of contact they had in mind. Table 8 also notes other elements which appeared in these definitions. Examples of miscellaneous elements are "spread without people knowing it", "can result in hospitalization", and "infected people should stay away from others". Overall, the definitions given were quite simple and straightforward. The definitions contained from 1 to 7 elements. The average number of elements per definition was 2.58. Fifteen definitions (28%) contained only one element.

While each subject spontaneously mentioned relatively few, if any, modes of transmission in his or her definition, when asked directly "what are the most common ways a person can get a contagious disease" subjects mentioned substantially more ways. The number of transmission modes mentioned by subjects ranged from 1 to 7 with a mean of 3.85. Table 9 lists the modes of

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Insert Table 9 about here.
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transmission given by subjects along with the frequency with which they were mentioned. As will be noted from the table, the most frequently mentioned forms of transmission were those categorized as casual contact. Ninety-two percent of the subjects mentioned at least one form of casual contact. The most frequently listed mode of transmission was through the air (such as germs in the air, being breathed on or being coughed on) followed by contact with contaminated items (such as water glass used by a sick person or eating food prepared by a sick person but excluding contaminated needles) and physical touching (excluding sexual contact). Other types of casual contact mentioned were kissing, contact with saliva, eating food prepared by the person and "casual contact" without further qualification. Blood contact was also frequently mentioned but with lower frequency than casual contact. Sixty-nine percent of the subjects mentioned one or more form of blood contact. In this category sexual contact was the most frequently mentioned followed by exchange of fluids and blood transfusions. In addition to these two major categories a few subjects also mentioned transmission through the environment (e.g., playing with dirt), poor sanitation, or some other form of transmission (e.g., heredity).

Finally, we wished to ascertain which diseases come to mind when people think about contagious diseases and which of these they perceive as being the most typical. Subjects were first asked to list all of the contagious diseases they could think of and then to rate a list of diseases in terms of how typical each one is of the subject's conception of contagious disease. The results from these questions are shown in Tables 10 and 11. When asked to list

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Insert Tables 10 and 11 about here.
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contagious diseases subjects listed from 2 to 18 diseases with the average being 8.49. Table 10 lists the most frequently cited contagious diseases. Probably due to the amount of media coverage which it has received, AIDS was the most frequently listed contagious disease. Flu was the second most frequently listed disease followed by the cold, chicken pox, measles, herpes, and mumps.

Examination of subjects' ratings of how typical various diseases are of their conception of contagious diseases (Table 11) indicated that subjects rated the flu as being the most typical contagious disease, followed by cold and chicken pox. Interestingly, AIDS and genital herpes were rated as being only

somewhat less typical than were cold and chicken pox, indicating that subjects perceived these two diseases as being relatively typical contagious diseases.

Overall, the results of this study confirmed our suspicions. Our subjects seemed to have a fairly rudimentary concept of contagious disease. For virtually all of the subjects the central concept related to contagious disease is that contagious diseases are ones which can be passed from person to person, a definition in line with the medical understanding of the concept. However, while the subjects held this as the central aspect of contagious disease they did not go much beyond that. Further, it is clear from these results that the concept of contagious disease is closely associated with casual forms of contact. Forms of casual contact were the most frequently mentioned both when subjects gave definitions given as well as when they listed ways in which one can get a contagious disease. In addition, there is evidence that certain diseases are seen as being prototypical of the category of contagious diseases. Specifically, the flu, followed by colds and chicken pox, is seen as being a highly typical contagious disease. All three of these diseases are spread through casual contact which further demonstrates the strong association between casual contact and the concept of a contagious disease.[2]

The results of these two studies point to important considerations for our understanding of illness cognition. The MDS results, taken together with those from other studies of cognitive models of physical illness, argue that contagiousness is a central, if not the central, dimension used by lay people in conceptualizing physical symptoms and disease. Studies in our laboratory have consistently found contagiousness to be the first, or among the first, dimensions obtained in analyses of subjects' models of both symptoms and diseases (Bishop, 1987, 1988). Similar results have been obtained by other investigators (cf. Penrod, 1980; Turk, Rudy, & Salovey, 1986[3]).

There are good reasons, stemming from both our underlying Western medical model as well as experience, as to why perceived contagiousness is a basic underlying dimension of lay illness cognitions. Engel (1977) notes that the biomedical model, which has formed the basis for modern medical science, has also become the folk medical model in Western countries. Germ theory, the idea that diseases can be caused by microorganisms transmitted from person to person, has been a part of the biomedical model since the time of Louis Pasteur (Evans, 1978). It is not surprising, then, that ideas and fears about contagion are a major part of our folk model of illness. While, for the most part, we no longer believe in spells, demons, or evil eyes, we do believe in bacteria, viruses, "bugs", and germs that go "cough" in the night. In fact, our belief in contagiousness is so strong that people sometimes react to persons with non-contagious diseases as if they were

contagious, as is seen in studies of reactions to cancer patients (cf. Wortman & Dunkel-Schetter, 1979).

Contagion as a part of our conceptual model of illness is also reinforced by common experience. Virtually everyone has, at one time or another, had one of the common contagious illnesses such as a cold, the flu, or one of the familiar childhood diseases such as chicken pox, measles, or mumps.

Even more important than the fact that contagiousness is a fundamental dimension of illness cognitions is how people understand contagious diseases. The data from the second study are quite clear that many of the subjects have a relatively rudimentary understanding of contagious disease and, in particular, tend to identify it with what has been termed "casual contact" -- transmission through the air, by non-intimate touching, contact with contaminated articles, or other everyday kinds of interaction. Further, the data suggest that diseases such as the flu, colds, and chicken pox, which are spread through casual contact, are perceived to be prototypical of the concept of contagious disease.

Are these beliefs erroneous? Not at all. The diseases listed by subjects are, for the most part, contagious. People do get the prototypical contagious diseases through casual contact. While these beliefs are not erroneous as such, they do set us up. Specifically, they set us up for exaggerated fears when a disease is caused by an infectious agent and is passed from person to person but not through casual contact.

The implications of these findings for people's responses to AIDS and persons with AIDS are quite straightforward. When presented with a new disease which is deadly and either thought or known to be transmitted by a virus people are likely to respond by applying to that disease their overall conception of a contagious disease. Since the concept of contagious disease is so closely associated with casual contact and prototypical contagious diseases are those which are spread by such means, it is not surprising that people should assume that there is at least a strong likelihood that this new disease is passed in the same way. This can be expected to be the case even when there are no explicit statements to the effect that the disease is spread through casual contact. This argues that hysteria over AIDS and the possibility of contracting it through everyday contact was quite likely inevitable. Even in the absence of the now infamous "household contact" theory (Shilts, 1987), it is likely that the mere identification of AIDS as being a contagious disease, caused by a virus, would have been sufficient to engender fear. These same considerations also point to reasons why the "household contact" theory was so readily believed by many and why such intensive efforts have been needed to counter public fear over AIDS and its spread. Convincing people that AIDS is not spread through casual

contact requires countering deeply ingrained ideas about the nature of contagious disease, ideas which are rooted in our Western folk model of illness and reinforced by common experience.

This line of thought also has implications for health education. Current AIDS education efforts focus on AIDS itself and how it is spread. These efforts are likely to be impeded by lay beliefs about the nature of contagion. A better approach might be to broaden the effort to include the concept of contagious disease in general. Rather than focusing specifically on AIDS, educate people about contagious diseases as a class, helping them to develope a more sophisticated understanding of contagion. In particular, teach people about subcategories of contagious disease, differentiating diseases which are passed through casual contact from those which are spread via sexual contact, animal vectors and so on. In this way people would have a set of categories available into which to place new or unfamiliar diseases and, hopefully, be less likely to apply a generic concept of contagion inappropriately.

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Footnotes

1. The fact that the degrees of freedom for the ANOVAs add up to only 67 is due to missing data for three subjects. Variables for this analysis included all of the disease rating scales from the Disease Rating Questionnaire as well as the "Responsible" scale from the Patient Interaction Questionnaire.

2. AIDS was mentioned the most frequently by subjects when asked to list contagious diseases but was rated as being less typical than these three. It seems quite likely that the tremendous publicity given to AIDS is a major factor in its high frequency of mention.

3. In their factor analyses of subjects' disease ratings on their Implicit Models of Illness Questionnaire, Turk, et al. label their first factor as seriousness. An examination of the loadings for this factor, however, reveal that the highest loading was, in fact, for contagiousness.

Table 1

Sample Page from Disease Rating Questionnaire

Chicken Pox

not fearful	: : : : : : : :	fearful
controllable	: : : : : : : :	not controllable
easy to get	: : : : : : : :	hard to get
painful	: : : : : : : :	not painful
not inherited	: : : : : : : :	inherited
caused by environment	: : : : : : : :	not caused by environment
uncommon	: : : : : : : :	common
not life threatening	: : : : : : : :	life threatening
contagious	: : : : : : : :	not contagious
not easily prevented	: : : : : : : :	easily prevented
related to stress	: : : : : : : :	not related to stress
does not require a doctor's attention	: : : : : : : :	requires a doctor's attention
well understood	: : : : : : : :	not well understood
not serious	: : : : : : : :	serious
related to behavior	: : : : : : : :	not related to behavior
I am not likely to get it	: : : : : : : :	I am likely to get it
caused by a virus	: : : : : : : :	not caused by a virus
not easily cured	: : : : : : : :	easily cured

Table 2

Mean Ratings for AIDS
On the Disease Rating Questionnaire

Scale	AIDS	All Diseases
Fearful	6.36	4.58
Controllable	2.66	4.57
Easy to get	4.93	4.48
Painful	6.63	5.54
Inheritable	2.80	2.96
Caused by environment	4.82	4.66
Common	5.18	5.15
Life threatening	6.99	4.53
Contagious	5.99	3.52
Preventable	4.65	4.26
Caused by stress	2.04	3.48
Requires a doctor's attention	6.99	6.22
Well understood	2.06	4.82
Serious	7.00	5.20
Caused by behavior	5.64	3.80
I am likely to get it	2.24	3.31
Caused by a virus	6.49	3.98
Easily cured	1.06	3.81

Notes:

All ratings were made on a 7-point scale scored such that high numbers indicate more of the quality in question.

Diseases rated in this questionnaire were: AIDS, appendicitis, arthritis, chicken pox, cold, diabetes, epilepsy, flu, genital herpes, heart attack, hypertension, infectious hepatitis, lung cancer, malaria, migraine headache, mononucleosis, pneumonia, polio, sinus infection, stomach cancer, stroke, and tonsillitis.

Table 3

Sample Stories Used in
Patient Interaction Questionnaire

Sandra is a 35-year old woman who works as a marketing representative for a clothing manufacturer. She is active in community activities and very much enjoys sports. Yesterday Sandra was informed by her doctor that she has mononucleosis.

Bill is a 28-year old man who works as a stock broker. He is active in community activities and very much enjoys sports. Yesterday Bill was informed by his doctor that he has AIDS.

Mark is a 33-year old man who works as a sales representative for a pharmaceutical company. His is active in church activities and enjoys coaching soccer. This morning Mark was informed by his doctor that he has a sinus infection.

Paula is a 39-year old woman who is the principal of a local elementary school. She is active in community activities and enjoys music. Last week Paula had a heart attack.

Table 4

Interaction Scores by Disease

Disease	Meet	Work	Guest	School	Next Door	Hours	Total
				Scale			
AIDS	4.21	4.03	3.56	4.32	4.81	3.92	24.85
Appendicitis	6.58	6.58	6.53	6.61	6.68	6.59	39.55
Arthritis	6.53	6.48	6.53	6.60	6.62	6.58	39.35
Flu	4.70	4.44	4.18	4.68	6.36	4.03	28.39
Genital Herpes	5.03	5.12	4.46	5.31	5.61	4.78	30.31
Heart Attack	6.53	6.45	6.48	6.53	6.62	6.56	39.16
Hepatitis	4.02	3.95	3.39	4.00	5.34	3.45	24.16
Lung Cancer	6.39	6.38	6.40	6.48	6.56	6.38	38.61
Migraine	6.57	6.45	6.56	6.54	6.60	6.43	39.14
Mononucleosis	4.68	4.59	4.07	4.70	5.95	4.52	28.51
Polio	5.83	5.84	5.76	5.91	6.24	5.79	35.36
Sinus Infection	6.31	6.29	6.02	6.25	6.58	6.02	37.47

Table 5

Correlations between Perceive Contagion and Willingness to Interact

Scale	r
Meet	-0.92**
Work with	-0.91**
Guest in home	-0.94**
Go to school with	-0.90**
Live next door	-0.74*
Spend hours with	-0.93**
Total	-0.92**

Note: * $p < .001$
** $p < .0001$

Table 6

Differences between Phobic and Non-Phobics

Scale	Phobics	Non-Phobics	p
Caused by environment	6.14	4.13	<.001
Preventable	4.25	5.23	<.07
Painful	6.96	6.70	<.10

Table 7

Sample Definitions

"A disease that can be transmitted from one person to another."

"It means to me that I can catch the disease if I'm too close to someone who has it. Either physical contact or in the same air space."

"The disease is easily transferred from person to person through touching or breathing the same air."

"It means that the disease is able to spread to other people without them knowing about it."

"A contagious disease is one that can be passed from one individual to another indiscriminately through either casual or intimate contact, the cause usually being due to either a bacteria, virus or other foreign body."

Table 8

Elements of Contagious Disease Definitions

Element	Frequency
1. Disease is passed from person to person	52 (98.1)
2. Mode of transmission	28 (52.8)
A. Casual contact	18 (34.0)
B. Blood contact	8 (15.1)
C. Contact (unspecified)	10 (18.9)
D. Vector	3 (5.7)
E. Other	3 (5.7)
3. Disease agent	8 (15.1)
4. Other	16 (30.2)
Average number of elements per definition	2.58

Notes: N = 53.

Numbers in parentheses are the percentage of subjects who listed one or more elements in that category.

Table 9
Perceived Modes of Transmission

Mode	Frequency
1. Casual Contact	50 (92.2)
A. Through the air	35 (67.3)
B. Through contaminated objects	22 (42.3)
C. Physical touching	20 (38.5)
D. Kissing	9 (17.3)
E. Saliva	5 (9.6)
F. Other casual contact	9 (17.3)
2. Blood Contact	36 (69.2)
A. Sexual contact	25 (48.1)
B. Exchange of fluids	11 (21.1)
C. Blood transfusions	9 (17.3)
D. Infected needles	8 (15.4)
3. Environment	16 (30.8)
A. Contaminated food or water	10 (19.2)
B. Insect or animal bites	5 (9.6)
C. Other	4 (7.5)
4. Poor Sanitation	5 (9.6)
5. Other	9 (17.3)

Notes:

N = 52 (one subject listed diseases rather than modes of transmission).

Numbers in parentheses are the percentage of subjects who listed one or more examples of that mode of transmission.

Numbers for subcategories add up to more than the numbers for the summary categories because subjects often listed more than one mode of transmission within a summary category.

Table 10

Contagious Diseases Listed Most Frequently

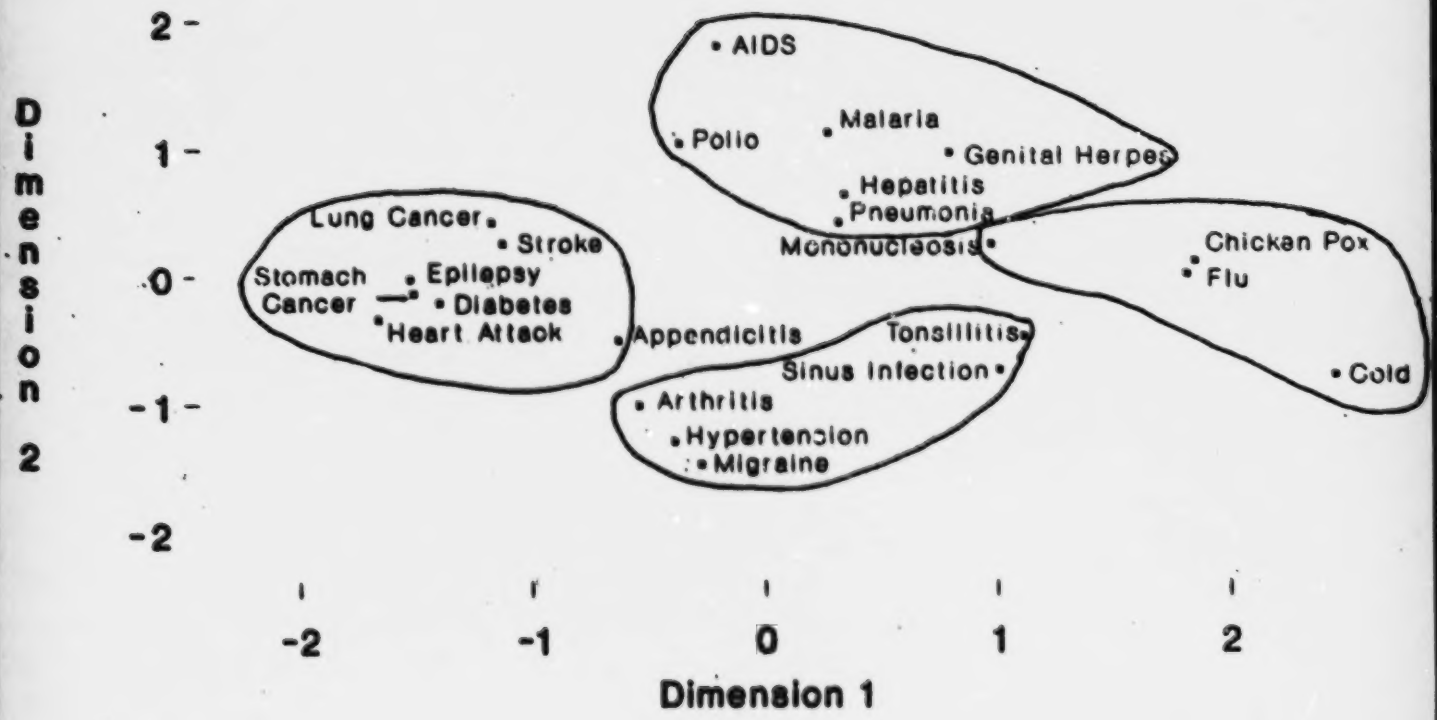
Disease	Frequency
AIDS	41 (77.4)
Flu	39 (73.6)
Cold	37 (69.8)
Chicken pox	35 (63.0)
Measles	29 (54.7)
Herpes	22 (41.5)
Mumps	20 (37.7)
Venereal Disease	18 (34.0)
Strep infection	15 (28.3)
Syphilis	14 (26.4)
Gonorrhea	14 (26.4)
Mononucleosis	13 (25.5)
Polio	11 (20.8)
Smallpox	11 (20.8)
Malaria	11 (20.8)

Note: N = 53. Numbers in parentheses indicate percentage of subjects who listed the disease.

Table 11

Typicality Ratings for Diseases

Disease	Rated Typicality
Flu	6.20
Cold	6.13
Chicken Pox	5.83
Mononucleosis	5.60
AIDS	5.56
Genital Herpes	5.55
Hepatitis	4.67
Malaria	4.15
Polio	3.54
Pneumonia	3.16
Tonsillitis	2.98
Sinus Infection	2.55
Hypertension	1.75
Heart Attack	1.73
Stroke	1.66
Arthritis	1.60
Lung Cancer	1.56
Appendicitis	1.50
Stomach Cancer	1.50
Migraine Headache	1.49
Diabetes	1.49
Epilepsy	1.39


AIDS
Malaria
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Genital Herpes
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Mononucleosis
Lung Cancer
Stroke
Stomach Cancer
Epilepsy
Diabetes
Heart Attack
Appendicitis
Tonsilitis
Sinus Infection
Arthritis
Hypertension
Migraine
Chicken Pox
Flu
Cold
2
1
0
-1
-2
-2
-1
0
1
2
Dimension 2
Dimension 1

Figure 1